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内蒙古巴彦乌兰地区始新世哺乳类及相关地层问题[1)]

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摘要 记述了在内蒙古巴彦乌兰地区发现的4种始新世哺乳动物化石，其中包括1个啮齿类新种——*Mergenomys neimongolensis* sp. nov.。新种与在蒙古共和国发现的属型种 *M. orientalis* 的不同在于个体大，下臼齿下外脊和下次小尖相对偏于唇侧。新化石的发现以及对岩石地层的分析表明巴彦乌兰剖面上原认为的伊尔丁曼哈组应包含伊尔丁曼哈及沙拉木伦组两个地层单位。

关键词 内蒙古巴彦乌兰，伊尔丁曼哈组，沙拉木伦组，乌兰戈楚组，啮齿类，兔形类

中图法分类号 Q915.87

1998年6月，本文作者与时福桥同志一行4人对内蒙古巴彦乌兰地区进行了短期考察，观察了该地剖面上不同层位的地层、追踪地层界线、并进行了脊椎动物化石的采集。在脑木根平台北缘陡坎的一套红色泥岩中找到了4种化石，其中包括本地首次发现的戈壁兔以及我国首次发现的 *Mergenomys*。这些化石不仅具有古生物地理的意义，而且对认识化石产出地层及其相关的地层划分对比问题也有很大的帮助，故本文予以简要记述，并对有关的地层问题进行了探讨。这些地层问题主要涉及伊尔丁曼哈组、沙拉木伦组以及乌兰戈楚组。

1 标本记述

啮齿目 Rodentia Bowdich, 1821

梳趾鼠超科 Superfamily Ctenodactyloidea Tullberg, 1899

迈根鼠 *Mergenomys* Dashzeveg and Meng, 1998

内蒙古迈根鼠 *Mergenomys neimongolensis* sp. nov.

(图版 I, 1～3)

正型标本 一右下颌骨残段附颊齿 m1～m2 及 p4 的齿槽(V 11701)。

1) 中国科学院重点项目(编号：KZ952-J1-410)资助。

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地点与时代 内蒙古二连浩特西南巴彦乌兰地区，中始新世沙拉木伦期。

特征 一种与 *Mergenomys orientalis* 下臼齿形态相近，但个体较大、下外脊和下次小尖较偏唇侧的梳趾鼠类动物。

描述与比较 残破的下颌骨上可见一较大之圆形颏孔，位于p3的下方。咬肌窝深，前缘达m1前。咬肌脊发育、粗壮，向前伸至p4的下方。下门齿在颊齿齿槽的下方直伸至下颌的上升支。

下颊齿齿冠特别低，齿尖发育，齿脊低弱。

p4未保存，从齿槽判断，为双根，长大于宽，后侧宽于前侧。下臼齿相当低冠，虽为丘脊形齿，但齿脊很不发育。m1近长方形或梯形，后壁较明显地宽于前壁。下后尖圆锥状，高而突出，与下原尖在横向上比较对齐。下后脊Ⅰ十分低弱。下后脊Ⅱ(下原尖后臂)短，向后内伸与下外脊相接。短而浅的三角座盆向后方开口。下外脊短，位于牙齿纵中轴稍偏外，并向后外延伸至下次尖。无下中尖。下次尖和下内尖均为圆锥状，大小相近，之间以沟隔开。无下次脊。下次尖和下内尖与下次小尖之间均有浅沟相隔。下次小尖脊(下后边脊)横向，其上的下次小尖不十分明显。m2不同于m1在于个体大得多，前壁和后壁宽度接近相等，有极弱的伸向下外脊的下次脊，但不与下外脊相连，中间有深沟隔开。下次小尖大而明显，位置偏于唇侧。

表1 *Mergenomys neimongolensis* sp. nov. 的下臼齿测量与比较

Table 1 Measurements and comparison of the lower molars of *Mergenomys neimongolensis* sp. nov. (mm)

	m1			m2		
	长(L)	宽(W)		长(L)	宽(W)	
		三角座 (tri)	跟座 (tal)		三角座 (tri)	跟座 (tal)
Mergenomys neimongolensis sp. nov. (V 11701)	1.9	1.3	1.6	2.2	1.7	1.8
*Mergenomys orientalis**	1.4	1.1	1.3	1.76	1.4	1.52

* After Dashzeveg and Meng (1998), L=length W=width tri=trigonid tal=talonid.

从上面描述可知，内蒙古的标本下颌骨咬肌窝深，前缘达m1前缘，咬肌脊伸达p4下方，在p3之下有颏孔。下颊齿低冠，齿脊不发育。p4只保留两齿槽，从齿槽判断，牙齿长大于宽，后壁可能宽于前壁。m1比m2明显地小， 两者下后脊Ⅰ低弱，下后脊Ⅱ短且与下外脊相接，下外脊向后外伸与下次尖相连。下次脊不发育，下次尖与下内尖之间有明显的深沟，下次小尖横向延伸形成下次小尖脊。这些特点均与蒙古共和国发现的 *Mergenomys orientalis* 一致或相近，因此内蒙古标本归入 *Mergenomys* 属应该没有问题。但与属型种相比，内蒙古标本尺寸较大(见表1)，下外脊不是位于牙齿中纵轴上，而是略偏外，m2的下次小尖偏于唇侧，因而两者可能为不同种。新种比属型种个体大，下外脊和下次小尖偏外有可能是进步的特征。*Mergenomys orientalis* 产于蒙古伊尔丁曼哈期地层中，新种所在层位若比伊尔丁曼哈期晚，则可能为沙拉木伦期，即中始新世晚期。

兔形目　Lagomorpha　Brandt, 1855

兔科　Leporidae　Gray, 1821

戈壁兔属　*Gobiolagus*　Burke, 1941

戈壁兔未定种　*Gobiolagus*　sp.

（图版 I，4～6）

材料为一左下颌骨残段带颊齿 m1～m2（V 11702）。地点和层位与上述 *Mergenomys neimongolensis* sp. nov.同。m1 冠面稍残缺，m2 较完整。这两颗牙齿尺寸相对较大，齿冠较高，尤其是单面高冠现象十分显著。三角座与跟座在舌面有釉质和齿质相连，后一个牙齿的跟座比前一个大得多，这些都是戈壁兔（*Gobiolagus*）的典型特点。因此尽管这两颗牙齿是中间颊齿，鉴定较为困难，但我们仍可把它们认为是戈壁兔。戈壁兔属为 Burke（1941）所建，原包括 4 个种——托氏戈壁兔（*Gobiolagus tolmachovi*）、安氏戈壁兔（*G. andrewsi*）、大戈壁兔（? *G. major*）和德氏戈壁兔（*G. teilhardi*）。德氏戈壁兔近年来已被另建新属——鄂尔多斯兔（*Ordolagus*）（de Muizon, 1977；黄学诗，1986）。本文标本不能归入鄂尔多斯兔的原因是：牙齿齿冠仍为半高冠或单面高冠，三角座后壁无向后突起。大戈壁兔个体相对较大，颌骨粗壮，三角座前后向不压缩（即牙齿相对较长），均与本文记述的标本不一样。我们的标本可能属于托氏戈壁兔或安氏戈壁兔，但托氏戈壁兔与安氏戈壁兔的主要区别在 p3，即前者 p3 较方圆，后者 p3 侧向压缩，牙齿显得窄长。而我们的标本偏偏没有保存 p3，很难确定是那一种，所以本文以未定种处之。托氏戈壁兔产于内蒙古巴伦索地区的沙拉木伦组中，而安氏戈壁兔出自内蒙古沙拉木伦地区的乌兰戈楚组中。也就是说本文记述的戈壁兔未定种的时代应该是沙拉木伦期到乌兰戈楚期。

表 2　戈壁兔未定种下臼齿（V 11702）的测量与比较

Table 2　Measurements and comparison of the lower molars (V 11702) of *Gobiolagus* sp. (mm)

	m1		m2	
	长(L)	宽(W)	长(L)	宽(W)
Gobiolagus sp. (V 11702)	2.0	2.3	2.2	2.6
*Gobiolagus tolmachovi**	2.0	2.5	2.1	2.8
*Gobiolagus andrewsi**	2.0	2.3	2.2	2.5

* After Burke (1941).

在与上面记述的化石同地点同层位还找到两种奇蹄类，一是带 p3～p4（或 p4～m1）的一段右下颌骨（V 11703）。由于齿冠很破碎，无法做进一步的鉴定。牙齿的长宽分别是 7.2，7.1 和 2.8，3.0mm。另一标本是右距骨（V 11704），保存完整，几乎所有特征均能观察到。两滑车脊间的滑囊窝较深。近远向长宽分别为 73 和 81mm。在中晚始新世，这样大的距骨当属犀牛类和雷兽类，但犀类的距骨通常较长，而这块标本宽反而稍大于长，因此它有可能属于雷兽的距骨。

上面记述的化石，两种奇蹄类由于标本保存太差无时代意义。根据 *Mergenomys neimongolensis* 确定的地质时代为伊尔丁曼哈期或沙拉木伦期，而 *Gobiolagus* sp. 的时代为沙拉木伦期或乌兰戈楚期，因此根据发现的啮齿类和兔形类，含化石地层的时代为晚中始新世沙拉木伦期较为合适。

2 地层问题讨论

中国乃至亚洲始新世地层的许多层型剖面都建立在蒙古高原，其中大多数见于中国的内蒙古自治区(见 Russell et Zhai，1987)。这些地层单位包括格沙头、伯姆巴、阿山头、伊尔丁曼哈、沙拉木伦、乌兰戈楚、呼尔井等岩石组以及相关的地层体。本文涉及的地层问题，主要是巴彦乌兰剖面上部的层位，尤其是产出化石的一套红色泥岩。这套地层与伊尔丁曼哈、沙拉木伦以及乌兰戈楚组有关。其他层位的问题在别的报告中已有涉及(孟津，1990；Meng *et al.*，1998)，此处不再重复。

巴彦乌兰上部地层是脑木根平台(亦称神圣高地)的主要组成部分。对该地地层古生物的研究始于 1928 年美国中亚考察团的考察。当时的野外记录将平台陡坎上的地层分为两部分：下部的"乌兰戈楚组"和上部的"巴伦索组"(参见 Meng *et al.*，1998)。江浩贤(1983)根据内蒙古地质局区测队 1962 至 1980 年间的工作，对二连盆地早第三纪地层划分对比做了比较系统的阐述，其中包括了对巴彦乌兰剖面的首次描述和讨论。齐陶(Qi，1987)又报道了同一剖面并讨论了有关的地层问题，尤其是阿山头的划分与对比。为了讨论方便，我们将江文中对剖面描述的有关部分摘引如下：

第四系

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上脑岗代组(上渐新统)	17. 松散黄色含砾粗砂岩，含哺乳动物化石巨犀(*Indricotherium* sp.)	6.6m
	---------- 假整合 ----------	
额尔登敖包组(下渐新统)	16. 杂色泥岩	2.6m
	15. 灰白色中粒长石石英砂岩，含哺乳动物化石大全脊貘(*Teleolophus magnus*)	0.5m
	14. 棕红色泥岩	2.8m
	13. 灰白色粉砂岩	3.3m
	12. 灰白色中粒长石石英砂岩	4.8m
	11. 浅棕红色泥岩	1.6m
	10. 灰白色含砾粗砂岩	0.3m
	---------- 假整合 ----------	
阿力乌苏组(上始新统)	9. 棕红色泥岩，含哺乳动物化石戈壁猪形兽(*Gobiohyus* sp.)、强中兽(? *Harpagolestes* sp.)	27.5m
	8. 松散锰砂岩及松散中粗粒砂岩，上部为灰白微黄色中粒长石石英砂岩。含哺乳动物化石全脊貘(*Telelophus* sp.)、蒙古小雷兽(*Microtitan mongoliensis*)和脊齿貘(*Lophialetes* sp.)	6.9m
	7. 杂色粉砂质泥岩，含哺乳动物化石假恐角兽(*Eudinoceras* sp.)、脊齿貘(*Lophialetes* sp.)、红山貘(*Rhodopagus* sp.)和蒙古小雷兽(*Microtitan mongoliensis*)	6.7m
	---------- 假整合 ----------	
阿山头组		
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江浩贤剖面中有几个问题值得提出：1)江使用了几个新的地层单位名称，包括上脑岗代组、下脑岗代组、额尔登敖包组和阿力乌苏组。在江的定义中，上脑岗代组相当于中亚考察团的呼尔井组，下脑岗代组相当于乌兰戈楚的上部，额尔登敖包组相当于乌兰戈楚的下部，而阿力乌苏组则包含了上部的沙拉木伦层和下部的伊尔丁曼哈层；2)在江的剖面描述中，下脑岗代组没有出现。因此上渐新统的上脑岗代组不整合覆于额尔登敖包组上，但江并未解释是否有地层缺失的情况。Qi(1987)虽然报道了同一个剖面，但在地层划分和名称上与江文有以下不同点：1)在剖面的第 17 层与 16 层间不存在假整合面；2)第 10 层至第 17 层统归于乌兰戈楚组；3)第 7 至第 9 层被认为是“伊尔丁曼哈层”，与下伏的“阿山头层”同属于伊尔丁曼哈组(对此划分的不同看法参见孟津，1990)。

本文描述的化石均采自江浩贤剖面中的第 9 层，这是一套 27.5m 厚的红色泥岩。从岩性及化石的情况看，该层应当为沙拉木伦组，而不应当是伊尔丁曼哈组(层)，伊尔丁曼哈组应仅包含第 7 和第 8 两层。以下几点理由支持我们的看法：1)尽管沙拉木伦组与伊尔丁曼哈组在二连盆地的东边和西边厚度有明显变化，甚至尖灭，但前者覆盖于后者之上的关系却不变。江浩贤(1983，p.34)曾指出：“以额尔登敖包剖面为代表，阿力乌苏组代表全部晚始新世沉积，它包括了下部伊尔丁曼哈层及上部的沙拉木伦层”。内蒙古区域地质志(1991，p.33)也认为沙拉木伦组底界整合覆于伊尔丁曼哈组上，而其上界与上覆的乌兰戈楚组由一假整合面相分隔。因此，巴彦乌兰剖面上第 9 层与下伏伊尔丁曼哈及上覆的乌兰戈楚关系当可以接受。2)伊尔丁曼哈组建组于二连盐池南边约 30 多公里处，其岩性为一套灰白色砂砾岩(Granger et Berkey，1922；Qi，1987)，而厚度却不大，在阿山头地区为 10m 左右，在呼和勃尔和地区仅有不到 6m(Qi，1987)。如果巴彦乌兰剖面上的第 9 层归入伊尔丁曼哈组，则该组在岩性、厚度上都与其附近出露的伊尔丁曼哈组相去甚远。相反，剖面中第 7 和第 8 两层为伊尔丁曼哈的划分与原始定义中的伊尔丁曼哈组从岩性上更为吻合，更为妥当。由于第 9 层与第 8 层间呈连续沉积，按上面内蒙古区域地质志的观点，第 9 层为沙拉木伦组似乎顺理成章。3)第 9 层中现已发现的化石与其他地区沙拉木伦期甚至乌兰戈楚期同类动物比较接近，表明第 9 层的时代应当晚于伊尔丁曼哈期。除了本文描述的化石外，王伴月等(1998)还报道了巴彦乌兰地点的一个壮鼠右下颌骨，核标本与在北京长辛店发现的一个幼年个体右下颌骨同被归入 *Eosischyromys youngi*。在对长辛店组的时代讨论中，王伴月等认为该组时代应为沙拉木伦期，即中始新世晚期。王等描述的一块化石产于巴彦乌兰“上部红层”，其层位并不十分明确。但从剖面岩性来看，王等文中“上部红层”应当是江浩贤描述的第 9 层。在王等文中“上部红层”被有疑问地看作是晚中始新世沙拉木伦组。另外，孟津(1991)还记述了由第 9 层中采到的两段残破对锥齿兽下颌(IVPP V 9929a–b)。这些材料与产自乌兰戈楚的标本一起被归入 *Ardynictis* 属中。因此，从化石以及地层关系两方面来看，第 9 层的时代应相当于沙拉木伦期或乌兰戈楚期，以前者更为合适。

综上所述，巴彦乌兰剖面中第 9 层红色泥岩应当为沙拉木伦组而不是伊尔丁曼哈组(层)。如果这一认识得以确定，则巴彦乌兰剖面从下到上就可能包含如下地层单位：脑木根组、阿山头组、伊尔丁曼哈组、沙拉木伦组、乌兰戈楚组和呼尔井组。其时代跨越了晚古新世到晚始新世的主要部分，成为研究始新统的一个重要剖面。从 20 年代以来，内蒙古地区早第

三纪地层古生物的研究虽然有了许多进展，但许多问题，包括巴彦乌兰地区在内，仍然需要更进一步的野外工作才能澄清。因此，我们希望今后的工作能对上述问题作出更好的回答。

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EOCENE MAMMALS FROM THE BAYAN ULAN OF NEI MONGOL (INNER MONGOLIA) AND COMMENTS ON RELATED STRATIGRAPHY

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Key words Bayan Ulan, Nei Mongol, Irdin Manha Fm., Sharamurun Fm., Ulangochu Fm., Rodentia, Lagomorpha

Summary

Four Eocene mammals were reported from the Bayan Ulan locality, Nei Mongol, China, including a new rodent species—— *Mergenomys neimongolensis*. The new species differs from the type species of the genus, *M. orientalis*, in being larger and having the ectolophid and hypoconulid more labially positioned. Based on the fossils and stratigraphic correlations, the beds that were previously considered to be "Irdin Manha Formation" in the Bayan Ulan section are actually two rock units: the Irdin Manha formation below and the Shara Murun formation above. The new materials come from the late Middle Eocene Shara Murun formation.

1 Systematic Paleontology

Order Rodentia Bowdich, 1821

Superfamily Ctenodactyloidea Tullberg, 1899

Genus *Mergenomys* Dashzeveg and Meng, 1998

***Mergenomys neimongolensis* sp. nov.**

(pl. I, 1～3)

Holotype A fragmentary right mandible with m1～m2 and the alveolus of p4(IVPP V 11701).

Locality and age The Bayan Ulan locality, southern Erlian Basin, Nei Mongol, China; the Middle Eocene Sharamurunian.

Diagnosis A ctenodactyloid rodent similar to *Mergenomys orientalis* but differing from the latter in being larger and the ectolophid and hypoconulid positioned more labially.

Description and comparison A single mental foramen is at the level of p3 on the mandible. The masseteric fossa is deep and extends to the level of anterior edge of ml. The masseteric crest is robust and reaches to below p4 anteriorly. The incisor is embeded underneath the cheek teeth and extends posteriorly to the ascending process of the mandible.

The p4 is not preserved. Judging from the two alveoli, the p4 probably is two-rooted, longer than wide, and wider posteriorly than anteriorly. Lower cheek teeth are brachyodont with poorly-developed ridges. The m1 is somewhat trapezoid and is wider posteriorly than anteriorly. The metaconid is conical, high and pointed, and is aligned with the protoconid. The metalophid I is weak. The metalophid II (the posterior arm of protoconid) is short and stretches posteromedially to join the ectolophid. The short and shallow trigonid basin opens posteriorly. The ectolophid is short, runs slightly lateral to the longitudinal axis of the tooth, and extends posterolaterally to the hypoconid. There is no mesoconid. The hypoconid and entoconid are conical, equal in size, and are separated by a valley. Each of the two cusps is further separated from the hypoconulid by a narrow groove. There is no hypolophid. The posterolophid is tranverse and bears a weak hypoconulid. The m2 differs from m1 in being much bigger. A very weak hypolophid extends toward the ectolophid but is separared from the latter by a deep groove. The hypoconulid is large and is positioned more labially.

The specimen is similar to *Mergenomys orientalis* from Mongolia (Dashzeveg and Meng, 1998). It differs from *M. orientalis* in being larger and having the ectolophid and hypoconulid positioned more labially. These may represent derived conditions in the new species, which appears consistent with the age estimate of the beds that generate the two species. *M. orientalis* is from the Irdinmanhan beds and the new species from the Sharamurunian (see below).

Order Lagomorpha Brandt, 1855

Family Leporidae Gray, 1821

Genus *Gobiolagus* Burke, 1941

***Gobiolagus* sp.**

(pl. I, 4～6)

Material A fragmentary left mandible with m1～m2 (V 11702) from the same

locality and beds of *Mergenomys neimongolensis*.

Description and comparison The crown of m1 is slightly damaged and the m2 is well preserved. These two teeth are relatively large and distinctively unihyposodont. The connection of the enamel and dentine between the trigonid and talonid and the m2 talonid being considerably larger than that of m1 are characteristics of *Gobiolagus*. Among the four species of *Gobiolagus* (Burke, 1941), *G. tolmachovi, G. andrewsi, G. major* and *G. teilhardi, G. teilhardi* has been replaced in the genus *Ordolagus* (de Muizon, 1977; Huang, 1986). The specimen described here is not an *Ordolagus* because its teeth are not so hyposodont as in species of *Ordolagus*; it is mainly unihyposodont. In addition, there is no posterior projection of the enamel in the trigonid. Among the three species of *Gobiolagus, G. major* is relatively large and has a stronger mandible than those in other species. Its trigonid is less compressed anteroposteriorly so that the teeth of *G. major* are relatively long. Our specimen may belong to *G. tolmachovi* or *G. andrewsi*, but *G. tolmachovi* and *G. andrewsi* differ in their p3 morphology, which is unfortunately not preserved in our specimen, therefore, further comparison is impossible. *G. tolmachovi* comes from the Sharamurun beds and *G. andrewsi* is from the Ulangochuan beds of Nei Mongol, which nonetheless provides certain constrain of the age for the beds where our specimen comes from.

In addition to the rodent and lagomorph, there is a fragmentary mandible of a perissodactyl, which bears broken p3～p4 (or p4～m1) and an astragalus of probably a brontotheriid.

2 Comments on the stratigraphy

There are some stratigraphic problems about the red beds exposed at the upper portion of the Bayan Ulan section, from which the specimens described here were collected. Several rock units, including Irdin Manha, Shara Murun, and Ulan Gochu formations, are considered in relation to the red beds.

The upper portion of the Bayan Ulan section forms the body of the Nomogen mess (Holy Mesa). According to the field notes by the Central Asiatic Expidition (CAE) in 1928, the sediments exposed at the Nomogen cliff were divided into two parts: the upper Baron Sog and lower Ulan Gochu formations (see Meng *et al.*, 1998). As a result of the regional geological mapping, Jiang (1983) reported the Bayan Ulan section and employed several stratigraphic terms differing from those used by the CAE. An English version of the same section was provided by Qi (1987), although divisions and names of these rock units slightly differ from those of Jiang. In both Jiang and Qi's sections, the 9th bed is a 27.5m thick redish clays, which Jiang considered as part of his "Aliusu Formation" whereas Qi included it in his "Irdin Manha Formation". We believe the 9th red-bed in the Bayan Ulan section is most

likely Shara Murun Formation for the reasons listed below.

1) Jiang pointed out that the "Aliusu Formation" contains all Eocene sediments in this region, which include the lower Irdin Manha beds and the upper Shara Murun beds. The geological memoirs of Nei Mongol Autonomous Region (1991) also stated that the Shara Murun Formation rests conformably on the Irdin Manha Formation and is separated by a disconformity from the overlying Ulan Gochu Formation. If the 9th red-bed is considered the Shara Murun Formation, these relationships appear acceptable.

2) The type section of the Irdin Manha Formation is at the southeast of the Erlian City. The formation is about 10m thick, or thiner toward the east, and is typical of grey-green or grey-yellow sandstones with coarse gravels. If the 9th red-bed is included in the Irdin Manha Formation, it is inconsistent with the original definition of the formation. In contrast, we believe the 7th and 8th beds in Jiang's section are consistent with the definition of the Irdin Manha Formation.

3) The fossils found from the 9th red-bed are similar to those found in either Shara Murun or Ulan Gochu formations elsewhere in the Mongolian Plateau, suggesting an age younger than the Irdinmanhan. In addition to the fossils described here, a specimen belonging to *Eosischyromys youngi*, of which the holotype comes from the Changxindian Formation of Beijing, is also found in the "upper red beds" of Bayan Ulan section (Wang *et al.*, 1998). In the discussion, Wang *et al.* considered the Changxindian Formation is probably Sharamurunian age. Because the red-beds referred to by Wang *et al.* are most likely the 9th red-bed in Jiang's section, the *E. youngi* specimen therefore provides another argument for the Sharamurunian age of the 9th red-bed in concern here. Moreover, fragmentary materials of didymoconids that are assigned to *Ardynictis* (Meng, 1991), a genus that is known from Ulangochuian, are collected from the 9th red-bed. This again indicates that the redbed is unlikely Irdin Manha.

In conclusion, we believe the age of the 9th red-bed in the Bayan Ulan section is probably the Sharamurunian. Given this understanding, the Bayan Ulan section now contains six subunits ranging from bottom to up: The Nomogen, Arshanto, Irdin Manha, Shara Murun, Ulan Gochu, and Houldjin formations.

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References

Burke J J, 1941. New fossil Leporidae from Mongolia. Am Mus Novit, (1117): 1～23

Dashzeveg D, Meng J, 1998. New Eocene ctenodactyloid rodents from the eastern Gobi Desert of Mongolia and a phylogenetic analysis of ctenodactyloids on dental features. Am Mus Novit, (9881): 1～20

de Muizon C, 1977. Revision des Lagomorphes des couches a Baluchitherium (Oligocene superieur) de San-tao-ho (Ordos Chine). Bull Mus Natl Hist Nat (Paris), ser 3e, no.488 (Sci Terre 65): 265～292

Granger W, Berkey C P, 1922. Discovery of Cretaceous and older Tertiary strata in Mongolia. Am Mus Novit, 42: 1～7

Huang X S (黄学诗), 1986. Fossil leporids from the Middle Oligocene of Ulantatal, Nei Mongol. Vert PalAsiat (古脊椎动物学报), **24**(4): 274～284 (in Chinese with English summary)

Jiang H X (江浩贤), 1983. Division of Early Tertiary strata in Erlian Basin, Nei Mongol. Geol Nei Mongol (内蒙古地质), **55**: 18～36 (in Chinese)

Meng J (孟津), 1990. A new species of Didymoconidae and comments on related locality and stratigraphy. Vert PalAsiat (古脊椎动物学报), **28**(3): 206～217 (in Chinese with English summary)

Meng J 1991. Craniodental morphology and systematics of Didymoconidae (Insectivora, Mammalia). Ph. D thesis, New York: Columbia University. 1～405

Meng J, Zhai R, Wyss A R, 1998. The Late Paleocene Bayan Ulan Fauna of Inner Mongolia, China. Bull Carnegie Mus Nat Hist, **34**: 148～185

Qi T, 1987. The Middle Eocene Arshanto Fauna (Mammalia) of Inner Mongolia. Ann Carnegie Mus Nat Hist, **56**: 1～73

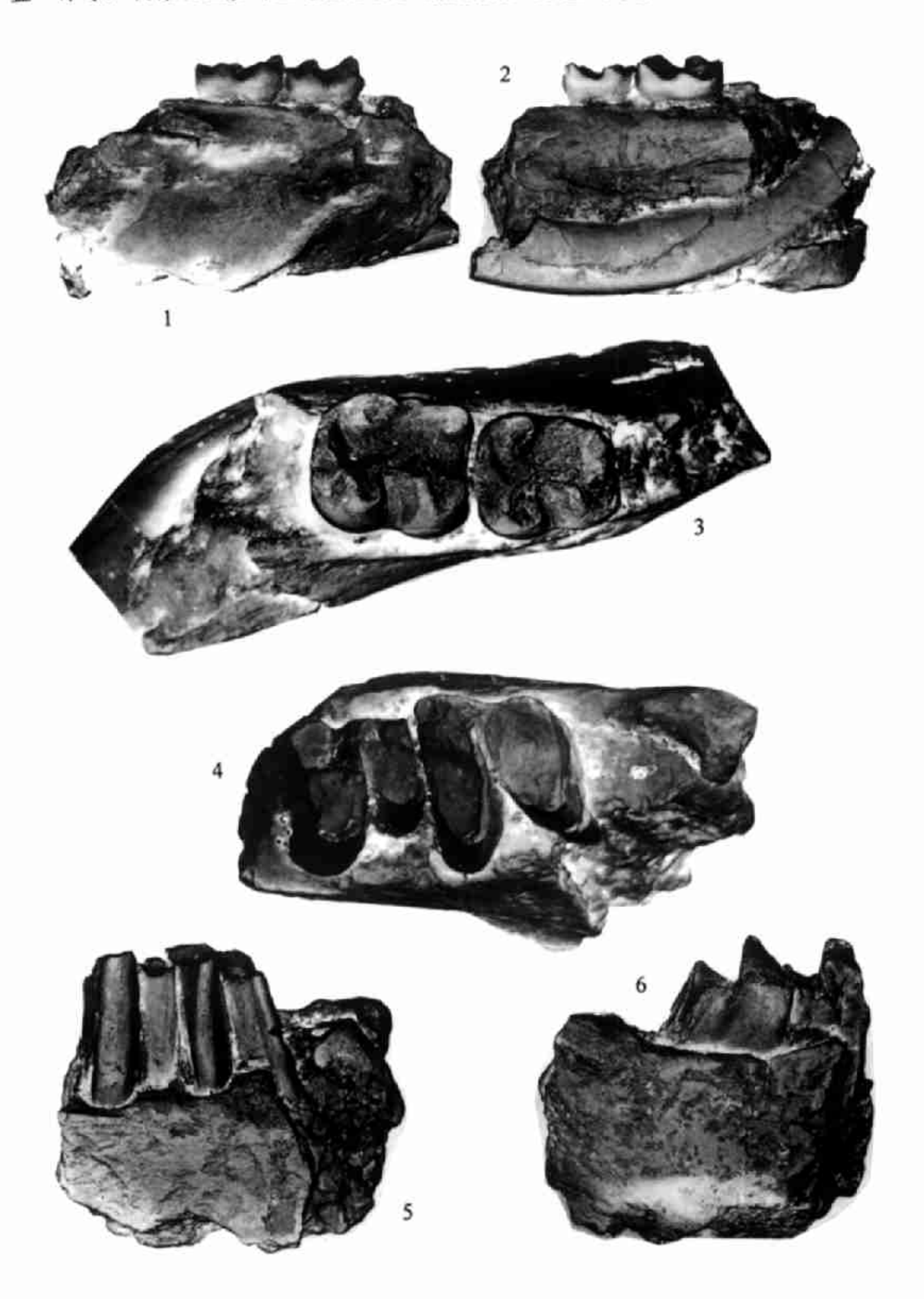
Russell D E, Zhai R, 1987. The Paleocene of Asia: Mammals and Stratigraphy. Mem Mus Natl Hist Nat, **52**: 1～488

Wang B Y (王伴月), Zhai R J (翟人杰), Dawson M R, 1998. Discovery of Ischyromyinae (Rodentia, Mammalia) from the Middle Eocene of North China. Vert PalAsiat (古脊椎动物学报), **36**(1): 1～12 (in Chinese with English summary)

图版 I 说明 (Explanations of Plate I)

1～3 Right lower jaw with m1～m2 (V 11701) of *Mergenomys neimongolensis* sp. nov. 1. labial view × 5; 2. lingual view × 5; 3. crown view × 10

4～6 Left lower jaw with m1～m2 (V 11702) of *Gobiolagus* sp. 4. crown view × 10; 5. labial view × 5; 6. lingual view × 5


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